

S/N 09/259,849

PATENT

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of: Paul A. Farrar

Examiner: Dilinh P. Nguyen

Serial No.: 09/259,849

Group Art Unit: 2814

Filed: March 1, 1999

Docket: 303.557US1

For: CONDUCTIVE STRUCTURES IN INTEGRATED CIRCUITS

**RESPONSE TO NOTICE OF NON-COMPLIANT APPEAL BRIEF**

MS Appeal Brief - Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

This responds to the Notice of Non-Compliant Appeal Brief mailed on April 16, 2007. In compliance with M.P.E.P. §1205.03(B) and 37 C.F.R. §41.37(c)(1)(v), Appellant submits the following corrected section from Appellant's previously-submitted Appeal Brief filed April 13, 2006.

Please replace the previously-submitted Summary of Claimed Subject Matter Section 5 with the below replacement:

**5. SUMMARY OF CLAIMED SUBJECT MATTER**

**Claim 1 – Application page 6, line 18 through page 9, line 2, Fig. 1.**

Claim 1 includes a method of forming a conductor comprising depositing an insulator (125) over a planarized surface; etching a trench (130) having a depth on the insulator; depositing a barrier layer (135) on the insulator; depositing a seed layer (140) directly on the barrier layer; removing the barrier layer and seed layer from selected areas (160) of the insulator, leaving a seed area (155); and depositing a conductor (145) on the seed area by a selective deposition process after removing the barrier layer and seed layer from selected areas of the insulator; wherein the selected areas are directly on a top surface of the insulator.

**Claim 4 - Application page 6, line 18 through page 9, line 2, Fig. 1.**

Claim 4 includes a method of forming a conductor comprising depositing an oxide layer (125) over a planarized surface; etching a trench (130) on the oxide layer; depositing a barrier layer (135) on the oxide layer; depositing a seed layer (140) on the barrier layer without a layer between the seed layer and the barrier layer; removing the barrier layer and seed layer from unused areas (160) of the oxide layer, leaving a seed area (155); and depositing a conductor (145) on the seed area after removing the barrier layer and seed layer from unused areas of the oxide layer; wherein the unused areas are directly on a top surface of the oxide layer.

**Claim 12 - Application page 6, line 18 through page 9, line 2, Fig. 1.**

Claim 12 includes a method of forming a conductor comprising depositing an oxide layer (125) over a planarized surface; etching a trench (130) on the oxide layer; depositing a barrier layer (135) of tantalum on the oxide layer; depositing a seed layer (140) selected from the group consisting of gold, silver, and copper on the oxide layer;

removing the barrier layer of tantalum and seed layer from unused areas (160) of the oxide layer, leaving a seed area (155); and depositing a conductor (145) on the seed area after removing the barrier layer of tantalum and seed layer from unused areas of the oxide layer; wherein the unused areas are directly on a top surface of the oxide layer.

**Claim 15 - Application page 6, line 18 through page 9, line 2, Fig. 1.**

Claim 15 includes a method of forming a conductor comprising depositing an oxide layer (125) over a planarized surface; etching a trench (130) on the oxide layer; depositing a barrier layer (135) of tantalum on the oxide layer; depositing a seed layer (140) of gold on the oxide layer; removing the barrier layer of tantalum and seed layer from selected areas (160) of the oxide layer, leaving a seed area (155); and depositing gold on the seed area after removing the barrier layer of tantalum and seed layer from selected areas of the oxide layer; wherein the selected areas are directly on a top surface of the oxide layer.

**Claim 19 - Application page 6, line 18 through page 9, line 2, Fig. 1.**

Claim 19 includes a method of forming a conductor comprising depositing an oxide layer (125) over a planarized surface; etching a trench (130) on the oxide layer; depositing a barrier layer (135) selected from the group consisting of titanium, zirconium, and hafnium on the oxide layer; depositing a seed layer (140) of silver on the oxide layer; removing the barrier layer and seed layer from selected areas (160) of the oxide layer, leaving a seed area (155); and depositing silver on the seed area after removing the barrier layer and seed layer from selected areas of the oxide layer; wherein the selected areas are directly on a top surface of the oxide layer.

**Claim 23 - Application page 6, line 18 through page 9, line 2, Fig. 1.**

Claim 23 includes a method of forming a conductor comprising depositing an oxide layer (125) over a planarized surface; etching a trench (130) on the oxide layer; depositing a barrier layer (135) selected from the group consisting of titanium, zirconium, and hafnium on the oxide layer; depositing a seed layer (140) of copper on the oxide

layer; removing the barrier layer and seed layer from selected areas or unused areas (160) of the oxide layer, leaving a seed area (155); and depositing aluminum on the seed area after removing the barrier layer and seed layer from selected areas or unused areas of the oxide layer; wherein the selected areas or the unused areas are directly on a top surface of the oxide layer.

**Claim 27 - Application page 6, line 18 through page 9, line 2, Fig. 1.**

Claim 27 includes a method of forming a conductor comprising depositing a polymer layer (125) over a planarized surface; etching a trench (130) on the polymer layer; depositing a barrier layer (135) selected from the group consisting of titanium, zirconium, and hafnium on the polymer layer; depositing a seed layer (140) selected from the group consisting of gold, silver, and copper on the polymer layer; removing the barrier layer and seed layer from selected areas (160) of the polymer layer, leaving a seed area (155); and depositing a conductor (145) on the seed area after removing the barrier layer and seed layer from selected areas of the polymer layer; wherein the selected areas are directly on a top surface of the polymer layer.

**Claim 30 - Application page 6, line 18 through page 9, line 2, Fig. 1.**

Claim 30 includes a method of forming a conductor comprising depositing a polymer layer (125) over a planarized surface; etching a trench (130) on the polymer layer; depositing a barrier layer (135) selected from the group consisting of titanium, zirconium, and hafnium on the polymer layer; depositing a seed layer (140) of gold on the polymer layer; removing the barrier layer and seed layer from selected areas or unused areas (160) of the polymer layer, leaving a seed area (155); and depositing gold on the seed area after removing the barrier layer and seed layer from selected areas or unused areas of the polymer layer; wherein the selected areas or the unused areas are directly on a top surface of the polymer layer.

**Claim 34 - Application page 6, line 18 through page 9, line 2, Fig. 1.**

Claim 34 includes a method of forming a conductor comprising depositing a polymer layer (125) over a planarized surface; etching a trench (130) on the polymer layer; depositing a barrier layer (135) selected from the group consisting of titanium, zirconium, and hafnium on the polymer layer; depositing a seed layer (140) of silver on the polymer layer; removing the barrier layer and seed layer from selected areas (160) of the polymer layer, leaving a seed area (155); and depositing silver on the seed area after removing the barrier layer and seed layer from selected areas of the polymer layer; wherein the selected areas are directly on a top surface of the polymer layer.

**Claim 38 - Application page 6, line 18 through page 9, line 2, Fig. 1.**

Claim 38 includes a method of forming a conductor comprising depositing a polymer layer (125) over a planarized surface; etching a trench (130) on the polymer layer; depositing a barrier layer (135) selected from the group consisting of titanium, zirconium, and hafnium on the polymer layer; depositing a seed layer (140) of copper on the polymer layer; removing the barrier layer and seed layer from unused areas (160) of the polymer layer, leaving a seed area (155); and depositing copper on the seed area after removing the barrier layer and seed layer from unused areas of the polymer layer; wherein the unused areas are directly on a top surface of the oxide layer.

**Claim 42 - Application page 6, line 18 through page 9, line 2, Fig. 1.**

Claim 42 includes a method of forming a conductor comprising depositing an oxide layer (125) over a planarized surface; etching a trench (130) on the oxide layer; depositing a barrier layer (135) selected from the group consisting of zirconium and titanium on the oxide layer; depositing a seed layer (140) of aluminum-copper on the oxide layer; removing the barrier layer and seed layer from selected areas (160) of the oxide layer, leaving a seed area (155); and depositing a conductor (145) on the seed area after removing the barrier layer and seed layer from selected areas of the oxide layer; wherein the selected areas are directly on a top surface of the oxide layer.

**Claim 45 - Application page 6, line 18 through page 9, line 2, Fig. 1.**

Claim 45 includes a method of forming a conductor comprising depositing an oxide layer (125) over a planarized surface; etching a trench (130) on the oxide layer; depositing a barrier layer (135) of zirconium on the oxide layer; depositing a seed layer (140) of aluminum-copper on the oxide layer; removing the barrier layer and seed layer from selected areas (160) of the oxide layer, leaving a seed area (155); and depositing aluminum on the seed area after removing the barrier layer and seed layer from selected areas of the oxide layer.

**Claim 50 - Application page 6, line 18 through page 9, line 2, Fig. 1.**

Claim 50 includes a method of forming a conductor comprising depositing an oxide layer (125) over a planarized surface; etching a trench (130) on the oxide layer; depositing a barrier layer (135) of titanium on the oxide layer; depositing a seed layer (140) of aluminum-copper on the barrier layer; removing the barrier layer and seed layer from selected areas or unused areas (160) of the oxide layer, leaving a seed area (155); and depositing aluminum on the seed area after removing the barrier layer and seed layer from selected areas of the oxide layer; wherein the selected areas are directly on a top surface of the oxide layer.

**Claim 56 - Application page 6, line 18 through page 9, line 2, Fig. 1.**

Claim 56 includes a method of forming a conductor comprising depositing an oxide layer (125) over a planarized surface; etching a trench (130) having a top (170) on the oxide layer; depositing a barrier layer (135) of tantalum nitride on the oxide layer; depositing a seed layer (140) of copper directly on the barrier layer of tantalum nitride without a layer between the seed layer of copper and the barrier layer of tantalum nitride; removing the barrier layer and seed layer from selected areas (160) of the oxide layer; depositing a conductor (145) on the seed area leaving a seed area; and depositing a layer (150) of tantalum nitride above the conductor after removing the barrier layer and seed layer from selected areas of the oxide layer; wherein the selected areas are directly on a top surface of the oxide layer.

**Claim 67 - Application page 6, line 18 through page 9, line 2, Fig. 1.**

Claim 67 includes a method of forming a conductor comprising depositing an oxide layer (125) over a planarized surface; etching a trench (130) having a top (170) on the oxide layer; depositing a barrier layer (135) of tantalum nitride on the oxide layer; depositing a seed layer (140) of copper on the barrier layer of tantalum nitride; depositing a seed layer of copper directly on the barrier layer of tantalum nitride without a layer between the seed layer of copper and the barrier layer of tantalum nitride; removing the barrier layer and seed layer from selected areas (160) of the oxide layer, leaving a seed area (155); depositing a layer of copper on the seed area after removing the barrier layer and seed layer from selected areas of the oxide layer; and depositing a layer (150) of tantalum nitride above the layer of copper; wherein the selected areas are directly on a top surface of the oxide layer.

**Claim 186 - Application page 6, line 18 through page 9, line 10, Fig. 1.**

Claim 186 includes a method of forming a conductor comprising depositing an insulator layer (115) over a substrate (105) having at least one device (110); depositing a diffusion barrier layer (120) over the insulator layer; planarizing a surface of the diffusion barrier layer; depositing a different insulator layer (125) over the planarized surface of the diffusion barrier layer; fabricating a connector (165) in the different insulator layer, wherein fabricating the connector in the different insulator layer includes, etching a trench (130) having a depth on the different insulator layer; depositing a barrier layer (135) on the different insulator layer; depositing a seed layer (140) on the barrier layer; removing the barrier layer and seed layer from selected areas (160) of the different insulator layer, leaving a seed area (155); and depositing a conductor (145) on the seed area of the connector by a selective deposition process after removing the barrier layer and seed layer from selected areas of the different insulator layer; wherein the selected areas are directly on a top surface of the different insulator layer.

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This summary does not provide an exhaustive or exclusive view of the present subject matter, and Appellant refers to the appended claims and its legal equivalents for a complete statement of the invention.

**Conclusion**

In accordance with M.P.E.P. §1205.03(B) and 37 C.F.R. §41.37(c)(1)(v), only the non-compliant section of Appellant's previously-submitted Appeal Brief has been included in this response.

Appellant respectfully submits that the amendments to Section 5 as provided herein comply with the requirements under 37 C.F.R. § 41.37(c) (1)(v).

Appellant respectfully requests the withdrawal of the non-complainant status of Appellant's previously-submitted Appeal Brief.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

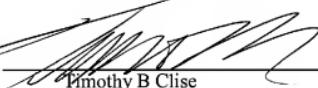
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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being filed using the USPTO's electronic filing system EFS-Web, and is addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 16 day of May, 2006.

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